UNITED
NATIONS

ST

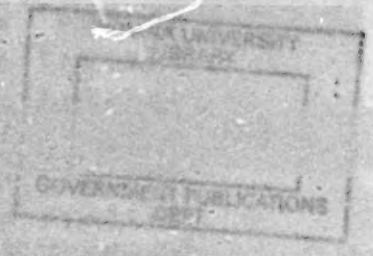
Secretariat

ST/SG/AC.10/C.3/24/Add.2
29 July 1996

ENGLISH

COMMITTEE OF EXPERTS ON THE TRANSPORT OF DANGEROUS GOODS

Sub-Committee of Experts on the Transport of Dangerous Goods



REPORT OF THE SUB-COMMITTEE OF EXPERTS ON ITS TWELFTH SESSION
(Geneva, 1-12 July 1996)

Addendum 2

Annexes 3, 4 and 5

Annex 3 - Amendments to the draft reformatted Recommendations on the Transport of Dangerous Goods (English only) (refer to ST/SG/AC.10/C.3/R.700/Add.1)

Annex 4 - Draft amendments to the Recommendations on the Transport of Dangerous Goods (refer to ST/SG/AC.10/1/Rev.9)

Annex 5 - Draft amendments to the Manual of Tests and Criteria (refer to ST/SG/AC.10/11/Rev.2)

GE.96-23057

ANNEX 3

AMENDMENTS TO THE DRAFT REFORMATTED RECOMMENDATIONS ON THE TRANSPORT OF DANGEROUS GOODS (refer to ST/SG/AC.10/C.3/R.700/Add.1)

Amend ST/SG/AC.10/C.3/R.710/Rev.1 in accordance with ST/SG/AC.10/C.3/R.736 paras. 7, 8, 9, 10, 14, 15, 16 and 19 except as otherwise provided for below

Replace everywhere	**Table 2.3**	**by the reference number 2.3.2.5**
	Table 2.4	**by the reference number 2.4.2.3.2.4**
	2.4.2.3.2.4	**by 2.4.2.3.2.5**
	2.4.2.3.2.4.1	**by 2.4.2.3.2.5.1**
	2.4.2.3.2.4.2	**by 2.4.2.3.2.5.2**
	Table 2.5	**by the reference number 2.5.3.2.4**
	2.5.3.2.4	**by 2.5.3.2.5**
	2.5.3.2.4.1	**by 2.5.3.2.5.1**
	Table 2.7	**by the reference number 2.7.2.5**
	Table 3.1	**by the reference number 3.4.8**
	Table 3.2	**by the reference number 3.4.9**
	Table 5.1	**by the reference number 5.2.2.1.4**
	Table 6.1	**by the reference number 6.1.4.3.1.2**
	Table 7.1	**by the reference number 7.3.2.3**

(Doc. Ref. ST/SG/AC.10/C.3/R.734)

INTRODUCTION AND PURPOSE

1.1 to 1.5 **Amend paras. 1.1 to 1.5 as proposed in Annex 2 to ST/SG/AC.10/C.3/R.736**

1.6 to 1.8 **To be deleted**

1.15 **Delete text under (b)**

1.18 **To be deleted**

1.19 **To be transfered after 1.13**

Notes on the structure of the Model Regulation

Add the first three lines (up to reference to ST/SG/AC.10/11/Rev.2) from 1.1.2.1 of ST/SG/AC.10/C.3/R.700/Add.1.

Table of contents: to be amended in accordance with the amendments to Parts 1 to 7.

PART 1

Change the title to "General Provisions, Definitions and Training".

CHAPTER 1.1

Change the title of Chapter 1.1 to "General Provisions"

Delete editorial notes in 1.1.1 and 1.1.3

1.1.2 Delete existing section

Insert the following paragraphs:

"1.1.2 Dangerous Goods Forbidden from Transport"

1.1.2.1 Unless provided otherwise by these regulations, the following are forbidden from transport:

Any substance or article which, as presented for transport, is liable to explode, dangerously react, produce a flame or dangerous evolution of heat or dangerous emission of toxic, corrosive or flammable gases or vapours under normal conditions normally encountered in transport.

(Doc. Ref. ST/SG/AC.10/C.3/R.739)

1.1.3 (existing) Transfered to Chapter 1.2

CHAPTER 1.2

This Chapter is structured as follows:

1.2 Definitions and Unit of Measurements

1.2.1 Definitions

1.2.2 Units of Measurements"

1.2.1 Add the definition for "overpack" from existing 5.1.3.1

1.2.2 (existing) To be at the end of 1.2.1

Add a new 1.2.2 as follows:

"1.2.2 **Units of measurement**

The following units of measurement are applicable to this regulation:

Measurement of	SI Unit [a]		Acceptable alternative unit		Relationship between units
Length	m	(metre)	–		–
Area	m^2	(square metre)			
Volume	m^3	(cubic metre)	l [b]	(litre)	1 l = 10^{-3} m^3
Time	s	(second)	min	(minute)	1 min = 60 s
			h	(hour)	1 h = 3 600 s
			d	(day)	1 d = 86 400 s
Mass	kg	(kilogramme)	g	(gramme)	1 g = 10^{-3} kg
			t	(ton)	1 t = 10^3 kg
Mass density	kg/m^3		kg/l		1 kg/l = 10^3 kg/m^3
Temperature	K	(kelvin)	°C	(degree Celsius)	0 °C = 273.15 K
Difference of temperature	K	(kelvin)	°C		1 °C = 1 K
Force	N	(newton)	–		1 N = 1 kg · m/s^2
Pressure	Pa	(pascal)	bar	(bar)	1 bar = 10^5 Pa
					1 Pa = 1 N/m^2
Stress	N/m^2		N/mm^2		1 N/mm^2 = 1 MPa
Work) Energy) Quantity) of heat)	J	(joule)	kWh	(kilowatt hour)	1 kWh = 3.6 MJ
			eV	(electronvolt)	1 eV = 0.1602 × 10^{-18} J
Power	W	(watt)			1 W = 1 J/s = 1 N · m/s
Kinematic viscosity	m^2/s		mm^2/s		1 mm^2/s = 10^{-6} m^2/s
Dynamic viscosity	Pa · s		mPa · s		1 mPa · s = 10^{-3} Pa · s
Activity	Bq	(becquerel)			
Dose equivalent	Sv	(sievert)			

Note

*** The following round figures are applicable for the conversion of the units hitherto used into SI Units.**

Force

1 kg = 9.807 N
1 N = 0.102 kg

Stress

1 kg/mm² = 9.807 N/mm²
1 N/mm² = 0.102 kg/mm²

Pressure

1 Pa	**= 1 N/m² = 10⁻⁵ bar**	**= 1.02 × 10⁻⁵ kg/cm²**	**= 0.75 × 10⁻² torr**
1 bar	**= 10⁵ Pa**	**= 1.02 kg/cm²**	**= 750 torr**
1 kg/cm²	**= 9.807 × 10⁴ Pa**	**= 0.9807 bar**	**= 736 torr**
1 torr	**= 1.33 × 10² Pa**	**= 1.33 × 10⁻³ bar**	**= 1.36 × 10⁻³ kg/cm²**

Energy, Work, Quantity of heat

1 J	**= 1 Nm**	**= 0.278 × 10⁻⁶ kWh**	**= 0.102 kgm**	**= 0.239 × 10⁻³ kcal**
1 kWh	**= 3.6 × 10⁶ J**	**= 367 × 10³ kgm**	**= 860 kcal**
1 kgm	**= 9.807 J**	**= 2.72 × 10⁻⁶ kWh**	**= 2.34 × 10⁻³ kcal**
1 kcal	**= 4.19 × 10³ J**	**= 1.16 × 10⁻³ kWh**	**= 427 kgm**

Power

1 W	**= 0.102 kgm/s**	**= 0.86 kcal/h**
1 kgm/s	**= 9.807 W**	**= 8.43 kcal/h**
1 kcal/h	**= 1.16 W**	**= 0.119 kgm/s**

Kinematic viscosity

1 m²/s	**= 10⁴ St (Stokes)**
1 St	**= 10⁻⁴ m²/s**

Dynamic viscosity

1 Pa · s	**= 1 Ns/m²**	**= 10 P (poise)**	**= 0.102 kgs/m²**
1 P	**= 0.1 Pa · s**	**= 0.1 Ns/m²**	**= 1.02 × 10⁻² kgs/m²**
1 kgs/m²	**= 9.807 Pa · s**	**= 9.807 Ns/m²**	**= 98.07 P**

*** The International System of Units (SI) is the result of decisions taken at the General Conference on Weights and Measures (Address: Pavillon de Breteuil, Parc de St-Cloud, F-92 310 Sèvres).**

*** The abbreviation "L" for litre may also be used in place of the abbreviation "l" when a typewriter cannot distinguish between figure "1" and letter "l".**

The decimal multiples and sub-multiples of a unit may be formed by prefixes or symbols, having the following meanings, placed before the name or symbol of the unit:

Factor			Prefix	Symbol
1 000 000 000 000 000 000	$= 10^{18}$	quintillion	exa	E
1 000 000 000 000 000	$= 10^{15}$	quadrillion	peta	P
1 000 000 000 000	$= 10^{12}$	trillion	tera	T
1 000 000 000	$= 10^{9}$	billion	giga	G
1 000 000	$= 10^{6}$	million	mega	M
1 000	$= 10^{3}$	thousand	kilo	k
100	$= 10^{2}$	hundred	hecto	h
10	$= 10^{1}$	ten	deca	da
0.1	$= 10^{-1}$	tenth	deci	d
0.01	$= 10^{-2}$	hundredth	centi	c
0.001	$= 10^{-3}$	thousandth	milli	m
0.000 001	$= 10^{-6}$	millionth	micro	µ
0.000 000 001	$= 10^{-9}$	billionth	nano	n
0.000 000 000 001	$= 10^{-12}$	trillionth	pico	p
0.000 000 000 000 001	$= 10^{-15}$	quadrillionth	femto	f
0.000 000 000 000 000 001	$= 10^{-18}$	quintillionth	atto	a

NOTE: *10^9 = 1 billion is United Nations usage in English. By analogy, so is 10^{-9} = 1 billionth.*

(2) Whenever the word "weight" is used, it means "mass".

(3) Whenever the weight of a package is mentioned, the gross mass is meant unless otherwise stated. The mass of containers or tanks used for the carriage of goods is not included in the gross mass.

(4) Unless expressly stated otherwise, the sign "%" represents:

(a) in the case of mixtures of solids or of liquids, and also in the case of solutions and of solids wetted by a liquid: a percentage mass based on the total mass of the mixture, the solution or the wetted solid;

(b) in the case of mixtures of compressed gases: when filled by pressure, the proportion of the volume indicated as a percentage of the total volume of the gaseous mixture, or, when filled by mass, the proportion of the mass indicated as a percentage of the total mass of the mixture;
in the case of mixtures of liquefied gases and gases dissolved under pressure: the proportion of the mass indicated as a percentage of the total mass of the mixture.

(5) Pressures of all kinds relating to receptacles (such as test pressure, internal pressure, safety-valve opening pressure) are always indicated in gauge pressure (pressure in excess of atmospheric pressure); however, the vapour pressure of substances is always expressed in absolute pressure.

[(6) The following approximate conversion formula is authorized until SI units have been incorporated throughout the texts of this regulation.

1 kg/mm² = 10 N/mm² 1 kg/cm² = 1 bar]

(Doc. Ref. ST/SG/AC.10/C.3/R.736)

PART 2

Delete existing introductory notes (pages 28 and 29, ST/SG/AC.10/C.3/R.700/Add.1).

Insert a new chapter 2.0 as follows:

"CHAPTER 2.0

INTRODUCTION

Responsibilities

The classification shall be made by the appropriate competent authority when so required or may otherwise be made by the consignor.

2.0.1 Classes, divisions, packing groups

2.0.1.1 Definitions

Substances (including mixtures and solutions) and articles subject to these regulations are assigned to one of nine classes according to the hazard or the most predominant of the hazards they present. Some of these classes are subdivided into divisions. These classes and divisions are:

Class 1: Explosives

- **Division 1.1: Substances and articles which have a mass explosion hazard**
- **Division 1.2: Substances and articles which have a projection hazard but not a mass explosion hazard**
- **Division 1.3: Substances and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard**
- **Division 1.4: Substances and articles which present no significant hazard**
- **Division 1.5: Very insensitive substances which have a mass explosion hazard**
- **Division 1.6: Extremely insensitive articles which do not have a mass explosion hazard**

Class 2: Gases

- **Division 2.1: Flammable gases**
- **Division 2.2: Non-flammable, non toxic gases**
- **Division 2.3: Toxic gases**

Class 3: Flammable liquids

Class 4: Flammable solids; substances liable to spontaneous combustion; substances which, on contact with water, emit flammable gases

- Division 4.1: Flammable solids, self-reactive and related substances and desensitised explosives
- Division 4.2: Substances liable to spontaneous combustion
- Division 4.3: Substances which in contact with water emit flammable gases

Class 5: Oxidizing substances and organic peroxides

- Division 5.1: Oxidizing substances
- Division 5.2: Organic peroxides

Class 6: Toxic and infectious substances

- Division 6.1: Toxic substances
- Division 6.2: Infectious substances

Class 7: Radioactive materials

Class 8: Corrosives

Class 9: Miscellaneous dangerous substances and articles

The numerical order of the classes and divisions is not that of the degree of danger.

(Doc. Ref. ST/SG/AC.10/C.3/R.735)

2.0.1.2 Many of the substances assigned to Classes 1 to 9 are deemed, without additional labelling, as being environmentally hazardous. Wastes shall be transported under the requirements of the appropriate class considering their hazards and the criteria in these Regulations.

Wastes not otherwise subject to these Regulations but covered under the Basel Convention 1/ may be transported under Class 9.

(Doc. Ref. ST/SG/AC.10/C.3/R.736)

2.0.1.3 Within certain of these classes or divisions, the substances and articles are assigned to a packing group according to the degree of the danger they present:

high danger - packing group I
medium danger - packing group II
low danger - packing group III.

(Doc. Ref. ST/SG/AC.10/C.3/R.735)

1/ Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989).

2.0.1.4 Dangerous goods are determined to present one or more of the dangers represented by Classes 1 to 9 and Divisions and, if applicable, the degree of danger on the basis of the requirements in Chapters 2.1 to 2.9.

(Doc. Ref. ST/SG/AC.10/C.3/R.736)

2.0.1.5 Dangerous goods presenting a danger of a single class and division are assigned to that class and division and the degree of danger (Packing Group), if applicable, determined. When an article or substance is specifically listed by name in the Dangerous Goods List in Chapter 3.2, its class or division, its subsidiary risk(s) and - when applicable - its packing group are taken from this list.

(Doc. Ref. ST/SG/AC.10/C.3/R.735)

2.0.1.6 Dangerous goods meeting the defining criteria of more than one hazard class or division and which are not listed by name in the Dangerous Goods List, are assigned to a class and division and subsidiary risk(s) on the basis of the precedence of hazards in 2.0.3.

(Doc. Ref. ST/SG/AC.10/C.3/R.736)

2.0.2 UN numbers and proper shipping names

2.0.2.1. Dangerous goods are assigned to UN numbers and proper shipping names according to their hazard classification and their composition.

(Doc. Ref. ST/SG/AC.10/C.3/R.736)

2.0.2.2 Dangerous goods commonly carried are listed in the Dangerous Goods List in Chapter 3.2. Where an article or substance is specifically listed by name, it shall be identified in transport by the proper shipping name in the Dangerous Goods List. For dangerous goods not specifically listed by name, "generic" or "not otherwise specified" entries are provided (see 2.0.2.7) to identify the article or substance in transport.

Each entry in Dangerous Goods List is characterized by a UN number. This list also contains relevant information for each entry, such as hazard class, subsidiary risk(s) (if any), packing group (where assigned), packing and tank transport requirements, etc. Entries in the Dangerous Goods List are of the following four types:

(a) single entries for well defined substances or articles

e.g. 1090 acetone
1194 ethyl nitrite solution

(b) generic entries for well defined group of substances or articles

e.g. 1133 adhesives
1266 perfumery product
2757 carbamate pesticide, solid, toxic
3101 organic peroxide, type B, liquid

(c) specific n.o.s. entries covering a group of substances or articles of a particular chemical or technical nature

e.g. 1477 nitrates, inorganic, n.o.s.
1987 alcohols n.o.s.

(d) general n.o.s. entries covering a group of substances or articles meeting the criteria of one or more classes or divisions

e.g. 1325 flammable solid, organic, n.o.s.
1993 flammable liquid, n.o.s.

(Doc. Ref. ST/SG/AC.10/C.3/R.736)

2.0.2.3 All self-reactive substances of Division 4.1 are assigned to one of twenty generic entries in accordance with the classification principles and flow chart described in 2.4.2.3.3 and Figure 2.1.

(Doc. Ref. ST/SG/AC.10/C.3/R.700/Add.1)

2.0.2.4 All organic peroxides of Division 5.2 are assigned to one of twenty generic entries in accordance with the classification principles and flow chart described in 2.5.3.3.2 and Figure 2.2

(Doc. Ref. ST/SG/AC.10/C.3/R.700/Add.1)

2.0.2.5 A mixture or solution containing a single dangerous substance specifically listed by name in the Dangerous Goods List and one or more substances not subject to these regulations shall be assigned the UN number and proper shipping name of the dangerous substance, unless:

(a) the mixture or solution is specifically identified by name in these regulations; or

(b) the entry in these regulations specifically indicates that it applies only to the pure substance; or

(c) the hazard class or division, physical state or packing group of the solution or mixture is different from that of the dangerous substances; or

(d) there is significant change in the measures to be taken in emergencies.

In those other cases, except the one described in (a), the mixture or solution shall be treated as a dangerous substance not specifically listed by name in the Dangerous Goods List.

(Doc. Ref. ST/SG/AC.10/C.3/R.735)

2.0.2.6 For a solution or mixture when the hazard class, the physical state or the packing group is changed in comparison with the listed substance, the appropriate N.O.S. entry shall be used including its packaging and labelling provisions.

(Doc. Ref. ST/SG/AC.10/C.3/R.700/Add.1)

2.0.2.7 Substances or articles which are not specifically listed by name in the Dangerous Goods List shall be classified under a "generic" or "not otherwise specified" ("N.O.S.") proper shipping name. The substance or article shall be classified according to the class definitions and test criteria in this part, and the article or substance classified under the generic or "n.o.s." proper shipping name in the Dangerous Goods List which most appropriately describes the article or substance (see also the "List of Generic or N.O.S. Proper Shipping Names" in Appendix A).

This means that a substance is only to be assigned to an entry of type c), - as defined in 2.0.2.2 - if it cannot be assigned to an entry of type b), and to an entry of type d) if it cannot be assigned to an entry of type b) or c) 2/.

(Doc. Ref. ST/SG/AC.10/C.3/R.700/Add.1 et -/C.3/R.735)

2.0.3 Precedence of Hazard Characteristics

The table below shall be used to determine the class of a substance, mixture or solution having more than one risk, when it is not named in the Dangerous Goods List in 3.4.9. For goods having multiple risks which are not specifically listed by name in the Dangerous Goods List, the most stringent packing group denoted to the respective hazards of the goods takes precedence over other packing groups, irrespective of the precedence of hazard table in this chapter. The precedence of hazard characteristics of the following have not been dealt with in the Precedence of Hazards Table (below), as these primary characteristics always take precedence:

- substances and articles of Class 1,
- gases of Class 2,
- self-reactive and related substances and desensitized explosives of Division 4.1,
- pyrophoric substances of Division 4.2,
- substances of Division 5.2,
- substances of Division 6.1 with a Packing Group I inhalation toxicity 3/,
- substances of Division 6.2
- material of Class 7.

(Table 2.8 of ST/SG/AC.10/C.3/R.700/Add.1 to be included below.)

(Doc. Ref. ST/SG/AC.10/C.3/R.700/Add.1)

CHAPTER 2.4

Delete 2.4.2.3.4 (including 2.4.2.3.4.1, 2.4.2.3.4.2) and renumber subsequent paragraphs.

(Doc. Ref. ST/SG/AC.10/C.3/R.712)

2/ See also the "List of generic or n.o.s. proper shipping names" in Appendix A.

3/ Except for substances or preparations meeting the criteria of Class 8 having an inhalation toxicity of dusts and mists (LC_{50}) in the range of Packing Group I, but toxicity through oral ingestion or dermal contact only in the range of Packing Group III or less, which shall be allocated to Class 8.

CHAPTER 2.5

Delete 2.5.3.4 and renumber subsequent paragraphs.

(Doc. Ref. ST/SG/AC.10/C.3/R.713)

CHAPTER 2.10

2.10.1 Text transferred to Chapter 2.0

PART 3

CHAPTER 3.1

3.1.2.6.3
3.1.2.6.4
3.1.3.3
3.1.2.6.1
} Transfered to Chapter 2.0

CHAPTER 3.2

3.2.1 Add a footnote to the explanation for column 8, as follows:

"a/ In future editions of these Recommendations it is intended to extend packing instructions in 4.1.4 to cover all dangerous goods."

(Doc. Ref. ST/SG/AC.10/C.3/R.736)

3.2.2 Delete editorial note.

DANGEROUS GOODS LIST

Amend Chapter 3.2 in accordance with ST/SG/AC.10/C.3/R.786 with the following modifications:

UN 1950
UN 2037
} Add Special provision 277 in column 6

(Doc. Ref. ST/SG/AC.10/C.3/R.778)

In column 7, replace the quantity indicated by "NONE" for the following entries:

1162, 1196, 1298, 2985

In column 7, for UN 2794, 2795 and 2800, replace "NONE" by "1 litre"; and for UN 3028, replace "NONE" by "2 kg"

Retain "NONE" in column 7 for UN 1693 (confirmation that limited quantity provisions are not considered appropriate for UN 1693).

UN 3065, Packing Group II: In column (5), delete "146" and replace "146" by "145"
In column (7), replace "NONE" by "1L"

UN 3065, Packing Group III: In column (7), replace "NONE" by "5L"

CHAPTER 3.3

236 Add the following sentence:

"The quantity limit shown in column 7 of the Dangerous Goods List applies to the base material"

(ST/SG/AC.10/C.3/R.778)

Delete Special Provisions 253 to 264.

Add the new following Special provision 277:

"277 For aerosols or receptacles containing toxic substances the limited quantity value is 120 ml. For all other aerosols or receptacles the limited quantity value is 1000 ml."

CHAPTER 3.4

To be amended as proposed in the Annex to document ST/SG/AC.10/C.3/R.778.

PART 4

CHAPTER 4.1

Replace existing paragraph 4.1.1.2 with:

"4.1.1.2 Parts of packaging which are in direct contact with dangerous goods

a) shall not be affected or significantly weakened by those dangerous goods, and

b) shall not cause a dangerous effect in the package e.g. catalysing a reaction or reacting with the dangerous goods".

4.1.1.16, 4.1.3.11: To be deleted and add "Packing Instruction 410" as proposed in Annex A to ST/SG/AC.10/C.3/R.712 with the following changes:

- replace "should" with "shall";
- after "Chapter 7.1", insert "at the Packing Group II performance level"; and
- at the end, before "or self-accelerating", insert "and/".

4.1.1.17, 4.1.3.12.1, 4.1.3.12.3: To be deleted and add "Packing Instruction 520" as proposed in Annex 1 to ST/SG/AC.10/C.3/R.713 with the following changes:

- replace "should" with "shall";
- after "Chapter 7.1", insert "at the Packing Group II performance level";
- insert a footnote after the table:

  "1/ See 7.5.3.4 bottom opening allowed"; and
- at the end, insert: "or self-accelerating decomposition of the organic peroxide".

4.1.2.3 To be deleted and renumber subsequent paragraphs

4.1.2.5 To be deleted and add "Packing Instructions 620 and 621" as proposed in Annex 1 to ST/SG/AC.10/C.3/R.714 with the following changes:

- replace "must" with "shall", and
- delete the first sentence in "Packing Instruction 621"

4.1.4.1 Delete editorial note

4.1.4.1.2 Delete Note 1 to Note 7

Change Editorial Note into a Note

Amend chapter 4.1 in accordance with ST/SG/AC.10/C.3/R.738 with the following changes:

Replace everywhere "wood, natural" with "natural wood"

Page 5 Insert "(solid wetted, 1.1D)" after "112(a) PACKING INSTRUCTION"

Page 6 Insert "(solid dry, other than powder 1.1D)" after "112 (b) PACKING INSTRUCTION"

Page 7 Insert "(solid dry powder 1.1D)" after "112(c) PACKING INSTRUCTION"

Page 8 Insert "(solid wetted)" after "114(a) PACKING INSTRUCTION"

Page 9
- Insert "(solid dry)" after "114(b) PACKING INSTRUCTION"
- Add "plastics, removable head (1H2)" under "Drums" in the third column
- Delete particular packing requirement No.4

Page 10 Replace in the last line "are not allowed" with "shall not be used"

Page 12 Replace "This packing method" with "This packing instruction" (twice)

Page 13 Under "PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:", delete UN Nos 0238 and 0459 in the first sub-paragraph, and delete the second sub-paragraph: "2. For UN 0457...coating."

Page 14 **PACKING INSTRUCTION 131**

Under "PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS", insert "and 1..." after "Page" in "1.", and delete "2. For UN Nos 0030,... packagings."

PACKING INSTRUCTION 132(a)

Insert after "PACKING INSTRUCTION" the following: "(Articles consisting of closed metal, plastics or fibreboard casings that contain a detonating explosive, or consisting of plastics-bonded detonating explosives". (cf METHOD EP 32(a) in ST/SG/AC.10/1/Rev.9).

Page 15 **PACKING INSTRUCTION 132(b)**

Insert "(Articles without closed casings)" after PACKING INSTRUCTION

Delete "PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:" and the sub-paragraph below.

PACKING INSTRUCTION 133

Amend the first sub-paragraph under "PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS" to read:

"1. For UN Nos. 0043, 0212, 0225, 0268 and 0306, trays shall not be used as inner packagings."

Page 18 **PACKING INSTRUCTION 138**

Delete the second sub-paragraph: "2. For 0237... coating." under "PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:"

Page 19 **Delete the fourth sub-paragraph: "4. Wherever ... coating." under "PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:"**

Page 22 **Under "Paragraph 4.1.1.15.30bl", second line, for "in 4.1.4 and" read "4.1.4 and"**

Paragraph 4.1.1.15.17

Replace the proposed amendment to 4.1.1.15.17 by the following: Replace "EP01" by "Packing Instruction 101".

CHAPTER 4.2

4.2.4.1 Delete editorial note

4.2.4.2 Change editorial note into text, but deleting (a) and the last phrase.

PART 5

The amendments proposed in ST/SG/AC.10/C.3/R.736 (para. 15) was adopted.

CHAPTER 5.1

5.1.1 **Delete editorial note**

5.1.2 **Move existing 5.1.2 to 5.5.1**

The new 5.1.2 "Use of overpacks" will contain:

5.1.2.1: existing text of 5.1.3.2

5.1.2.2: existing text of 5.1.3.3

5.1.3 **To be numbered as 5.1.2 with the following changes:**

- **move the definition of "Overpack" to 1.2.1 (Definitions) and**
- **move 5.1.3.4 to 6.1.2.4**

5.1.3.4 **Move existing 5.1.3.4 to 6.1.2.4**

5.1.4 **Delete existing 5.1.4**

5.1.5 **Move existing 5.1.5 "Documentation..." to 5.5.2**

5.1.7 **Add the following additional paragraph 5.1.7:**

"5.1.7 Other than for class 7, a packaging which previously contained dangerous goods must be identified, marked, labeled and placarded as required for those dangerous goods unless adequate mesures are taken to nullify any hazard."

5.1.8 **Add the following additional paragraph as 5.1.8:**

"5.1.8 When two or more dangerous goods are packed within the same outer packaging, the package must be labeled and marked as required for each substance. Secondary risk labels need not be applied if the hazard is already represented by a primary risk label."

CHAPTER 5.2

5.2.1.2 **Add the following paragraph as a new 5.2.1.2:**

"5.2.1.2 All package markings required by 5.2.1.1:

1. **shall be readily visible and legible;**
2. **shall be able to withstand open weather exposure without a substantial reduction in effectiveness;**

3. shall be displayed on a background of contrasting color on the external surface of the package; and

4. shall not be located with other package markings that could substantially reduce their effectiveness."

5.2.1.3 Change the text in 5.2.1.3 as follows:

"Salvage packages shall additionally be marked with the word 'SALVAGE'"

5.2.1.4 Add the following additional paragraph as 5.2.1.4:

"5.2.1.4 Intermediate bulk containers of more than 450 litres capacity shall be marked on two opposing sides."

5.2.2.1.5 Replace 5.2.2.1.5 with the following:

"5.2.2.1.5 Each label shall:

.1 be located on the same surface of the package near the proper shipping name marking, if the package dimensions are adequate;

.2 be so placed on the packaging that they are not covered or obscured by any part or attachment to the packaging or any other label or marking; and

.3 when primary and subsidiary hazard labels are required, be displayed next to each other, if package dimensions are adequate.

Where a package is of such an irregular shape or small size that labels cannot be satisfactorily affixed, they may be attached to the package by a securely affixed tag or other suitable means."

5.2.2.1.6 Add the following new paragraph 5.2.2.1.6 (Renumber existing and subsequent paragraphs.)

"5.2.2.1.6 Intermediate bulk containers of more than 450 litres capacity must be labelled on two opposing sides."

CHAPTER 5.4

Insert a new paragraph 5.4.1.1.2 to read as follows:

"5.4.1.1.2 The information required on a transport document must be legible."

Insert the following new paragraph 5.4.1.1.8 (renumbering required):

"5.4.1.1.8 Empty means of containment (including packages, portable tanks, road transport tanks and railway transport tanks) which contain the residue of dangerous goods of other than Class 7 shall be described as such by, for example, placing the words "EMPTY UNCLEANED" or "RESIDUE LAST CONTAINED" before or after the proper shipping name."

Insert a new Chapter 5.5 as follows:

"CHAPTER 5.5 Special provisions

5.5.1 Special provisions applicable to consignment of infectious substances

5.5.1.1 Add existing text from 5.1.2.1

5.5.1.2 Add existing text from 5.1.2.2

5.5.2 Documentation and identification of fumigated transport units

5.5.2.1 Add existing text from 5.1.5.1

5.5.2.2 Add existing text from 5.1.5.2"

PART 6

Change the editorial note into an introductory note (see Annex 6 in ST/SG/AC.10/C.3/R.736, but deleting square brackets)

CHAPTER 6.1

6.1.1 Delete editorial note in 6.1.1

6.1.2.4 Insert a new 6.1.2.4 with the existing text of 5.1.3.4.

CHAPTER 7.5

The document ST/SG/AC.10/C.3/R.711 was adopted with the following changes:

a) Correction to be made on page 26, section 7.5.4.5.1:

replace "fitted with means of lifting" by "designed to be lifted" so as to read:

"7.5.4.5.1 Applicability

For all types of IBC which are designed to be lifted from the top and for flexible IBCs designed to be lifted from the top or the side, as a design type test;"

b) In section 7.5.3.1.7 on page 16, delete the value "> 0.25" in the table showing capacity value ranges. The first line would then show "≤ 1.0";

c) As a result of decision on ST/SG/AC.10/C.3/R.716, delete paragraph 7.5.3.1.3 and renumber the following subsequent paragraphs accordingly;

d) Keep the definition of IBCs under 1.2.1 and include the other definitions in Chapter 7.5 under a new 7.5.1.2. Existing sections 7.5.1.2 to 7.5.1.5 will then be renumbered accordingly (7.5.1.3 to 7.5.1.6).

ANNEX 4

DRAFT AMENDMENTS TO THE RECOMMENDATIONS ON THE TRANSPORT OF DANGEROUS GOODS

(ST/SG/AC.10/1/Rev.9)

CHAPTER 2

LIST OF DANGEROUS GOODS MOST COMMONLY CARRIED

UN 1105 Amend the name to read: "PENTANOLS"

UN 1366 Add the subsidiary risk "4.3" to column (b2) (Doc. Ref. ST/SG/AC.10/C.3/R.754)

UN 1370 Add the subsidiary risk "4.3" to column (b2) (Doc. Ref. ST/SG/AC.10/C.3/R.754)

UN 1500 Add the subsidiary risk "6.1" to column (b2) (Doc. Ref. INF.46)

UN 2003 Amend the name to read:

"METAL ALKYLS, WATER-REACTIVE, N.O.S. or METAL ARYLS, WATER-REACTIVE, N.O.S."

Add the subsidiary risk "4.3" to column (b2) (Doc. Ref. ST/SG/AC.10/C.3/R.754)

UN 2451 Transfer from Division 2.3 to Division 2.2 (Doc. Ref. ST/SG/AC.10/C.3/R.759)

UN 2666 To be deleted (Doc. Ref. ST/SG/AC.10/C.3/R.695)

UN 3049 Amend the name to read:

"METAL ALKYL HALIDES, WATER-REACTIVE, N.O.S. or METAL ARYL HALIDES, WATER-REACTIVES, N.O.S."

Add the subsidiary risk "4.3" to column (b2) (Doc. Ref. ST/SG/AC.10/C.3/R.754)

UN 3050 Amend the name to read:

"METAL ALKYL HYDRIDES, WATER-REACTIVE, N.O.S. or METAL ARYL HYDRIDES, WATER-REACTIVE, N.O.S."

Add the subsidiary risk "4.3" to column (b2) (Doc. Ref. ST/SG/AC.10/C.3/R.754)

UN 3051
UN 3052
UN 3053

Add the subsidiary risk "4.3" to column (b2) (Doc. Ref. ST/SG/AC.10/C.3/R.754)

UN 3076 In column (c2), add "M". **(Doc. Ref. ST/SG/AC.10/C.3/R.755)**

Add the subsidiary risk "4.3" in column (b2) **(Doc. Ref. ST/SG/AC.10/C.3/R.754)**

UN 3203 **Amend the name to read:**

"PYROPHORIC ORGANOMETALLIC COMPOUND, WATER-REACTIVE, N.O.S."

Add the subsidiary risk "4.3" to column (b2) **(Doc. Ref. ST/SG/AC.10/C.3/R.754)**

In column (c2), add "M". **(Doc. Ref. ST/SG/AC.10/C.3/R.755)**

UN 3319 **Read the name as follows:**

"NITROGLYCERIN MIXTURE, DESENSITIZED, SOLID, N.O.S. with more than 2 % but not more than 10 % nitroglycerin, by mass"

Add Special Provisions 192 and 274 in column (b3).

Add the following entries:

(a1)	(a2)	(b1)	(b2)	(b3)	(c1)	(c2)
3337	REFRIGERANT GAS R 404A	2.2				M
3338	REFRIGERANT GAS R 407A	2.2				M
3339	REFRIGERANT GAS R 407B	2.2				M
3340	REFRIGERANT GAS R 407C	2.2				M
(Doc. Ref. ST/SG/AC.10/C.3/R.774)						
3341	THIOUREA DIOXIDE	4.2		184		
3342	XANTHATES	4.2		174		
(Doc. Ref. INF.20)						
3343	NITROGLYCERIN MIXTURE, DESENSITIZED, LIQUID, FLAMMABLE, N.O.S. with not more than 30% nitroglycerin, by mass	3		109 274 278		
3344	PENTAERYTHRITE TETRANITRATE MIXTURE, DESENSITIZED, SOLID, N.O.S. with more than 10% but not more than 20% PETN, by mass	4.1		109 272 274		II

CHAPTER 3

SPECIAL PROVISIONS RELATING TO INDIVIDUAL SUBSTANCES AND ARTICLES

Special Provision 68, amend to read:

"68 This substance is sometimes classified as more than 70% should be placed in Packing Group I and bear a subsidiary risk label of Division 5.1; not more than 70 % should be placed in Packing Group II and not bear a subsidiary risk label." **(Doc. Ref. INF.45)**

Add a new Special Provision to read:

"278 These substances should not be classified and exceptions unless authorized by the competent authority on the basis of results from Series 2 tests and a Series 6(c) test on packages as prepared for transport (see para. 4.1.5.3). The competent authority should assign the Packing Group on the basis of the Chapter 5 criteria and the package type used for the Series 6(c) test.

CHAPTER 4

SPECIAL RECOMMENDATIONS RELATING TO CLASS 1

M **4.8.2.14** **Change the last sentence to read:**

M UN 2451

M UN 2666 **"Such unpackaged articles may be fixed to cradles or contained in crates or other suitable handling, storage or launching devices in such a way that they will not become loose during normal conditions of transport."**

UN 3049

(Doc. Ref. ST/SG/AC.10/C.3/R.601/Rev.1)

Add a new sub-paragraph as follows:

"Where such large explosive articles as part of their operational safety and suitability tests subjected to test regimes that meet the intent of these Recommendations and such tests have been successfully undertaken, the competent authority may approve such articles to be transported under these Recommendations."

UN 3050

II

UN 3051
UN 3052
UN 3053 } Add the subsidiary risk "4.3" to column (b2) (Doc. Ref. ST/SG/AC.10/C.3/R.754)

CHAPTER 5

SPECIAL RECOMMENDATIONS RELATING TO CLASS 3

Amend 5.6 (b) to read:

"5.6 (b) The mixture does not contain any substances with a primary or a subsidiary risk of Division 6.1 or Class 8".

5.6 Delete the Note.

CHAPTER 6

SPECIAL RECOMMENDATIONS RELATING TO CLASS 6

6.9.4 **Amend in accordance with the document ST/SG/AC.10/C.3/R.766 with the following change to the paragraph (b):**

"(b) Those manufactured and packaged in accordance with the requirements of national governmental health authorities and transported for the purpose of final packaging or distribution, and use for personal health care by medical professionals or individuals."

6.9.5
6.9.6
6.10.1
6.10.2 } **Amend in accordance with ST/SG/AC.10/C.3/R.766**

6.13.2 **At the end of the sentence add the following new sentence:**

"Complete packages may be overpacked in accordance with the provisions of 13.9: such an overpack may contain dry ice."

(Doc. Ref. ST/SG/AC.10/C.3/R.667)

6.13.3 **Amend 6.13.3 (b) (ii) as follows:**

"(ii) For substances consigned refrigerated or frozen, ice, dry ice or other refrigerant should be placed around the secondary packaging(s) or alternatively in an overpack with one or more complete packages marked in accordance with 6.13.6. Interior supports should be provided to retain secondary packaging(s) or packages in position after the ice or dry ice has dissipated. If ice is used, the outer packaging or overpack should be leakproof. If dry ice is used, the outer packaging or overpack should permit the release of carbon dioxide gas. The primary receptacle and the secondary packaging should maintain their integrity at the temperature of the refrigerant used."

CHAPTER 9

GENERAL RECOMMENDATIONS ON PACKING

9.2.1 **Amend the definition of recycled plastics as follows:**

Recycled plastics material **means material recovered from used industrial packagings that has been cleaned and prepared for processing into new packagings. The specific properties of the recycled material used for production of new packagings should be assured and documented regularly as part of a quality assurance programme recognized by the competent authority. The quality assurance programme should include a record of proper pre-sorting and verification that each batch or recycled plastics material has the proper melt flow rate, density, and tensile yield strength, consistent with that of the design type manufactured from such recycled material. This necessarily includes knowledge about the packaging material from which the recycled plastics have been derived, as well as awareness of the prior contents of those packagings if those prior contents might reduce the capability of new packagings produced using that material. In addition, the packaging manufacturer's quality assurance programme under 9.3.14 should include performance of the mechanical design type test in 9.7.6 on packagings manufactured from each batch of recycled plastics material. In this testing, stacking performance may be verified by appropriate dynamic compression testing rather than static load testing.**

9.6.7.2 **Add the sentence previously adopted to 9.6.7.1 (cf ST/SG/AC.10/C.3/22, Annex 2, page 47) as follows:**

"Packagings manufactured with such recycled plastics material should be marked "REC" near the marks prescribed in 9.5.1."

9.7.6.3 **Delete the sentence before last one.**

(Doc. Ref. ST/SG/AC.10/C.3/R.779)

CHAPTER 11

SPECIAL RECOMMENDATIONS RELATING TO CLASS 5

11.3.5.4 **Amend as follows:**

The following organic peroxides should be subjected to temperature control during carriage:

organic peroxides type B and C with an SADT ≤ 50 °C;

organic peroxides type D showing a medium effect when heated under confinement */ with a SADT ≤ 50 °C or showing a low or no effect when heated under confinement with a SADT ≤ 45 °C; and

organic peroxides types E and F with a SADT ≤ 45 °C.
(Doc. Ref. ST/SG/AC.10/C.3/R.752)

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*/ **As determined by test series E as prescribed in the current edition of the Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part II.**

11.3.6.2 Add as follows:

"11.3.6.2 Test methods for determining the flammability are given in Part III, 32.4 of the Manual of Tests and Criteria. Because organic peroxides may react vigorously when heated it is recommended to determine their flash point using small sample sizes such as described in ISO 3679."

11.3.10.6 (c) Replace by the following text:

"Single mechanical refrigeration; provided that for organic peroxides with a flashpoint lower than the sum of the emergency temperature plus 5 °C explosion-proof electrical fittings are used within the cooling compartment to prevent ignition of flammable vapours from the organic peroxides."

11.3.10.6 (e) Replace the last indent, by the following text:

"for organic peroxides with a flashpoint lower than the sum of the emergency temperature plus 5 °C explosion-proof electrical fittings are used within the cooling compartment to prevent ignition of flammable vapours from the organic peroxides."

(Doc. Ref. ST/SG/AC.10/C.3/R.751)

Table 11.4

1. Add an introductory note following the heading of Table 11.4 to read:

"Note: When consigning an organic peroxide in an IBC in accordance with the following provisions, it is the responsibility of the consignor to ensure that:

(1) The pressure and emergency relief devices installed on the IBC are designed to take appropriate account of the self-accelerating decomposition of the organic peroxide and of fire engulfment; and

(2) When applicable, the control and emergency temperatures indicated are appropriate, taking into account the design (e.g. insulation) of the IBC to be used."

2. Add a footnote to the column headings reading "Control Temperature" and "Emergency Temperature" with the footnote to read:

"2/ The temperatures indicated are based on a non-insulated IBC."

3. Amend the entry for "Peroxyacetic acid, stabilized, not more than 17%" as follows:

(a) in the third column ("Type of IBC"), add: "31HA1" and "31A", and

(b) in the fourth column ("Maximum quantity (litres)"), delete the figure "1000" and insert the figure "1500" for IBC types 31H1, 31HA1 and 31A.

(Doc. Ref. ST/SG/AC.10/C.3/R.742)

CHAPTER 12

Table 12.1

Add the following entries:

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3337	REFRIGERANT GAS R 404A	2.2		31.6 28.2 25.2 22.1	Allowed	Normal	0.82	
3338	REFRIGERANT GAS R 407A	2.2		32.3 29.0 25.7 22.4	Allowed	Normal	0.94	
3339	REFRIGERANT GAS R 407B	2.2		34.0 30.5 27.0 23.6	Allowed	Normal	0.93	
3340	REFRIGERANT GAS R 407C	2.2		30.2 27.0 24.1 21.4	Allowed	Normal	0.95	

(Doc. Ref. ST/SG/AC.10/C.3/R.774)

Table 12.2

Amend Table 12.2 in accordance with the amendments adopted for Chapter 2

Add the following entries:

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3076	Aluminium alkyl hydrides[2.10]	4.2/I	4.3	10	10 mm	N.A.	N.	12.22.3
3203	Pyrophoric organometallic compound, water-reactive, n.o.s. [2.10]	4.2/I	4.3	10	10 mm	N.A.	N.	12.22.3

(Doc. Ref. ST/SG/AC.10/C.3/R.754 et ST/SG/AC.3/R.755)

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*/ As determined by test series H as prescribed in the current edition of the Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part II.

Amend entry for UN 2790 as follows:

(3)	(4)	(5)	(6)	(7)	(8)	(9)
"8/II	**2.65**	**12.5.2**	**A/12.7.3**	**N.**	**12.22.3**
8/III	**2.65**	**12.5.2**	**A/12.7.2**	**N.**	**12.22.2"**

CHAPTER 13

RECOMMENDATIONS ON CONSIGNMENT PROCEDURES

13.2 **Amend 13.2 to read: "Marking".**

13.2.1 **Amend 13.2.1, first sentence at the end to read:**

"... on each package. In the case of unpackaged articles the marking should be displayed on the article, on its cradle or on its handling, storage or launching device."

13.3.1 **Amend first sentence to read:**

"The labels recommended in 13.4 should be affixed on goods or packages."

CHAPTER 15

SPECIAL RECOMMENDATIONS FOR DANGEROUS GOODS IN LIMITED QUANTITIES

15.3.2 **Amend and add at the end:**

", except that inner packagings that are liable to break or be easily punctured such as those made of glass, porcelain, stoneware or certain plastics, materials, etc, should not be transported in such packagings."

(Doc. Ref. ST/SG/AC.10/C.3/R.740)

Table 15.1 **For flammable liquids, Packing Group II, amend in the last column to read: "1 litre"**

(Doc. Ref. ST/SG/AC.10/C.3/R.719)

CHAPTER 16

RECOMMENDATIONS ON INTERMEDIATE BULK CONTAINERS (IBCs)

16.2.3.2 **To be deleted**

(Doc. Ref. ST/SG/AC.10/C.3/R.716)

LIST OF GENERIC OR N.O.S. PROPER SHIPPING NAMES

Amend as necessary, in accordance with the amendments adopted for Chapter 2.

INDEX

Amend the index in accordance with the amendments adopted for Chapter 2.

In addition, add the following entries:

Difluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane azeotropic mixture with approximately 23% difluoromethane and 25% pentafluoroethane, see	2.2	3337	
Difluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane azeotropic mixture with approximately 20% difluoromethane and 40% pentafluoroethane, see	2.2	3338	
Difluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane azeotropic mixture with approximately 10% difluoromethane and 70% pentafluoroethane, see	2.2	3339	
Pentafluoroethane, 1,1,1-trifluoroethane, and 1,1,1,2-tetrafluoroethane azeotropic mixture with approximately 44% pentafluoroethane and 52% 1,1,1-trifluoroethane, see	2.2	3340	

(Doc. Ref. ST/SG/AC.10/C.3/R.774)

Amend the name	"3-Methyl-2-penten-4-yne-1-ol, see	6	2705"
to	"3-Methyl-2-penten-4-ynol, see	6	2705"

(in french amend "Méthyl-3 pentène-2 yne-4-ol-1"
to "3-Méthylpent-2-ène-4-ynol"

Add a cross reference to the entry for thiourea dioxide as follows:

"Formamidine sulphuric acid, see	4.2	3341"	

(Doc. Ref. INF.30)

ANNEX 5

DRAFT AMENDMENTS TO THE MANUAL OF TESTS AND CRITERIA

(ST/SG/AC.10/11/Rev.2)

Figure 10.2

Replace respectively "New substance" in box 1 and "New Article" in box 14 with "Substance for Classification" and "Article for Classification".

(Doc. Ref. ST/SG/AC.10/C.3/R.733)

Box No.3 Add the following footnote:

"For classification purposes, start with test series 2."

32.3.7 (b) Amend to read:

"(b) The mixture does not contain any substances with a primary or a subsidiary risk of Division 6.1 or Class 8."

32.3.7 Delete the Note

UNITED NATIONS

ST

Secretariat

GENERAL

ST/SG/AC.10/C.3/24/Add.3
22 July 1996

Original: ENGLISH

COMMITTEE OF EXPERTS ON THE TRANSPORT OF DANGEROUS GOODS

Sub-Committee of Experts on the Transport of Dangerous Goods

REPORT OF THE SUB-COMMITTEE OF EXPERTS ON ITS TWELFTH SESSION
(Geneva, 1-12 July 1996)

Addendum 3

Annexes 6 and 7

REPORTS OF THE WORKING GROUPS ON THE HARMONIZATION OF CLASSIFICATION CRITERIA
(see ST/SG/AC.10/C.3/24, paras. 148 to 157)

Annex 6 - Report of the Working Group on Harmonization of Classification Criteria for Reactive Substances

Annex 7 - Report of the Working Group on Harmonization of Classification Criteria for Flammable Substances

Note by the secretariat: These working groups were convened in the context of cooperation with the International Labour Office (ILO), the Inter-Organization Programme on Sound Management of Chemicals (IOMC) and follow-up to the United Nations Conference on Environment and Development (UNCED) (Agenda 21, Chapter 19, Programme Area B).

GE.96-22847

ANNEX 6

Report of the Working Group on Harmonization of Classification Criteria for Reactive Subetances on its third session

GENERAL

1. The Working Group reconvened for the third time on 9 July 1996 during the twelfth session of the Sub-Committee on the Transport of Dangerous Goods (1-12 July 1996). Mr. R. Woodward (United Kingdom) served as chairman and Mr. I. Obadia (ILO) as rapporteur. Experts were asked to review document ST/SG/AC.10/C.3/R.610/Rev.2, as presented by the United Kingdom and in the light of new related documents and informal documents prepared to answer a number of issues raised during the second session of the Group in December 1995 (see ST/SG/AC.10/C.3/22/Add.2).

2. During its one day session, the Working Group could complete discussion of only portions of Parts 1, 2 and 3 of document ST/SG/AC.10/C.3/R.610/Rev.2., including new related documents and informal documents presented by the experts. Although discussion on how to finalize the report to ILO on the status of Group's progress on harmonization of physical hazard took place at different times during the session, debate on the subject is reported in paragraphs 15 and 16 at the end of this report so as to ensure its coherence.

PART 1: EXPLOSIVE SUBSTANCES

Definitions, tests, and classification

Documents: ST/SG/AC.10/C.3/R.748 (Germany)

Informal documents: INF. 16 (Germany)
INF. 34 (Germany)

3. The expert from Germany introduced document ST/SG/AC.10/C.3/R.748, and noted that a missing annex was provided in INF.16. Informal document INF.34 was a proposed amended version of Part 1 of ST/SG/AC.10/C.3/R.610/Rev.2 incorporating the changes proposed in ST/SG/AC.10/C.3/R.748 and INF.16. These documents had been prepared at the request of the Working Group during its December 1995 session to provide a possible solution to the classification of substances and articles which are explosive by design and substances which have intrinsic explosive properties, so as to take account of the classification requirements for sectors other than transport.

4. A number of experts noted that INF.34 had not been made available in sufficient time for them to evaluate it. Other experts questioned the validity of proposing a new classification scheme which seemed to differ significantly from the current system in the Recommendations on the Transport of Dangerous Goods. In order to solve the procedural questions raised and possible misunderstanding of the purpose of the two documents, the discussion on explosives was postponed to the afternoon session and an informal discussion led by the chairman of the Working Group to clarify the German proposal, was held during lunch break.

5. In resuming the debate, the Chairman informed the Working Group that a number of misunderstandings arising from ST/SG/AC.10/C.3/R.748 had been cleared during the lunch break meeting . Following an earlier suggestion by the expert from the United States of America, he proposed to pursue the discussion on the basis of document ST/SG/AC.10/C.3/R.610/Rev.2, and to add a footnote to that document to highlight the issue of intentional versus unintentional explosives.

6. After this was agreed, the representative of CEFIC and the expert from Sweden noted that recommendations 9 c) and 9 f) in ST/SG/AC.10/C.3/R.610/Rev.2 were not coherent. The expert from the United States of America proposed that 9 c) could be revised to mention only UN test series 2 and 3 and delete 9 f). The expert from the United Kingdom explained that the two recommendations were needed to reflect the fact that "Explosives" and "explosive properties" are two different issues. The expert from Germany stated that the classification of intentional explosives was not in question but that, especially for purposes other than transport, the issue of substances with explosive properties needed to be resolved and that the recommendations should show a clear separation between the two categories.

7. After further debate, the Working Group finally agreed to revise paragraph 9 c) as follows: "Tests used to determine explosive properties should be harmonized on UN test series 2 and 3 and, where appropriate, test series 1". The Chairman suggested that an explanatory footnote concerning the type of explosives covered by the UN system could be inserted in ST/SG/AC.10/C.3/R.610/Rev.2 with the understanding that the reservations placed by the expert from Canada over the risk of creating additional categories of explosives would be taken into account. No other recommendations in Part 1 of ST/SG/AC.10/C.3/R.610/Rev.2 were discussed. The expert from Canada agreed to convey his reservations in writing to the expert from the United Kingdom by the end of October 1996.

Screening procedures

Document: ST/SG/AC.10/C.3/R.672/Rev.1 (CEFIC)

Informal document: INF.10 (OECD-IGUS)

8. The representative of CEFIC introduced the above documents which contained proposals for screening procedures to determine whether the full classification tests for a harmonized system needed to be carried out. Document INF.10 contained proposals for amendments to the Manual of Tests and Criteria to include the procedure described in ST/SG/AC.10/C.3/R.672/Rev.1. Several experts recognized that the proposals were excellent from a technical point of view. The Chairman and the expert from the United Kingdom noted however that recommendation 11 j) in ST/SG/AC.10/C.3/R.610/Rev.2 stated that, while very useful, the screening procedure should be published as voluntary guidance only. The Working Group could only agree that the proposal in INF.10 was good but that decision on how to publish it or where to insert it should be postponed for the time being.

PART 2: ORGANIC PEROXIDES

Document: ST/SG/AC.10/C.3/R.775 (European Commission)

9. The expert from the United Kingdom noted that no modifications had been made, in ST/SG/AC.10/C.3/R.610/Rev.2, to the text previously presented in ST/SG/AC.10/C.3/R.610/Rev.1. The observer from the European Commission introduced document ST/SG/AC.10/C.3/R.775 describing the criteria for classifying organic peroxides and their basis according to the European Union Council Directive 67/548/EEC concerning the classification, packaging and labelling of dangerous substances. The concern of the European Commission was that an alignment of the harmonized criteria on those of the UN would lower the level of protection. She therefore proposed to have two cut-off points, one for transport and one for use. The chairman noted that the difference between the 0.5% and 1% available oxygen cut-off points under discussion was small and that it should be possible to reach agreement on one harmonized cut-off point.

10. A number of experts supported the two cut-off points approach or a harmonized cut-off at 0.5% while others preferred a 1% cut-off on the basis that the rationale for 0.5% was not convincing, in view of the large number of products such as adhesives and formulations used to replace chlorinated cleaning products that had a peroxide content between 0.5 and 1% which would need to be tested.

11. No consensus position could be reached on the European Commission proposal. It was agreed that this fact would be reflected in the final document on the status of harmonization of physical hazards to be transmitted to ILO and no further discussion on ST/SG/AC.10/C.3/R.775 concerning the cut-off point is necessary for the time being.

PART 3: OXIDIZING SUBSTANCES

Test methods

Document: ST/SG/AC.10/C.3/R.709 (Germany)

Informal document: INF.35 (Germany)

12. The expert from the United Kingdom introduced Part 3 of ST/SG/AC.10/C.3/R.610/Rev.2 and noted that a new paragraph 17 e) dealt with the issue of physical state of substances and testing for the purpose of classification and that paragraph 17 g) had been modified to reflect this problem.

13. The expert from Germany introduced document ST/SG/AC.10/C.3/R.709 on definitions and criteria for oxidizing gases and related document INF.35 on the classification procedure of gases as oxidizing substances. The results of a laboratory evaluation of the test prescribed in ISO 10156, using nitrous oxide (N_2O) as an oxidizing gas, showed that its application had some limitations in providing a reliable coefficient of oxygen equivalency. In particular the results were found to be dependant on the type and form of the plastics material used. The expert from Germany further proposed to use a procedure which is based on the oxygen limiting concentration with ethane as a combustible reference gas. Speaking on behalf of ISO, the expert from France inquired about the way in which the evaluation had been conducted and it was suggested that Germany and ISO get together to elaborate an improved proposal for the testing of oxidizing gases.

14. The chairman noted that, except for the ISO 10156 test, there was no disagreement on the recommendations in Part 3 and that no further work should be considered. However apart from those concerning the test method for oxidizing gases, no other discussions were carried out on Part 3 of ST/SG/AC.10/C.3/R.610/Rev.2.

FINAL STATUS REPORT OF THE WORKING GROUP TO ILO

15. The Chairman introduced a set of tables prepared in Germany as a possible example of format for reporting the final results of the working groups on both reactivity and flammability. He stressed the fact that the data shown in the table were included for illustration purposes only and were not factual. The idea was to extract the relevant recommendations from document ST/SG/AC.10/C.3/R.610/Rev.2 as amended by the Working Group and to insert them in the tables, indicating for each hazard category, the degree of consensus reached or lack of it. The tables should be done by the chairmen of both working groups and commented by members of the working groups by correspondence. A draft set of tables taking into account comments received by correspondence, attached to a introductory text with a summary of the harmonization status for each hazard category should be presented to the Committee in December 1996 for discussion before transmission to the ILO and then to the IFCS meeting in February 1997.

16. The chairman of the Sub-Committee agreed, as he could not see any other way forward. He indicated also that the work should be completed through a correspondence group with a deadline of mid-October */ to allow proper submission of the document to the Committee in December. It was understood that for the parts of ST/SG/AC.10/C.3/R.610/Rev.2 which were not be discussed at this session, the relevant recommendations in ST/SG/AC.10/C.3/R.610/Rev.1 would be reported unless new documents on this part were submitted to the Committee. It was also understood that a third revision of the document would not be produced. The expert from the United States of America stated that ST/SG/AC.10/C.3/R.610/Rev.2 should be used only to develop a list of specific criteria and tests for each hazard category under consideration by the working groups and that a tabular format was acceptable. A number of other experts supported this approach. There was no specific objection from the Working Group to this way forward.

17. The representative from ILO expressed regrets that the Working Group on Harmonization of Classification Criteria for Reactive Substances succeeded only partially in formulating a comprehensive set of harmonized classification criteria for physical hazards. He informed the Sub-Committee that the ILO would probably make a formal request through the IFCS or the Economic and Social Council that the Committee of Experts on the Transport of Dangerous Goods consider continuing this work during the next biennium, as he could not identify any other competent forum for doing this work.

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*/ Note by the secretariat: The deadline for submission of documents to the Committee is 20 September 1996.

ANNEX 7

REPORT OF THE WORKING GROUP ON HARMONIZATION OF CLASSIFICATION CRITERIA FOR FLAMMABLE SUBSTANCES

GENERAL

1. The third session of the Working Group on Harmonization of Classification Criteria for Flammable Substances was held on 10 July 1996 during the twelfth session of the Sub-Committee of Experts on the Transport of Dangerous Goods under the chairmanship of Mr. G. Oberreuter (Germany). Various experts from all delegations participating at the twelfth session of the Sub-Committee attended the meeting.

2. The Working Group worked on the basis of the report on its second session (ST/SG/AC.10/C.3/22/Add.2, Part II), and new submissions.

Document: ST/SG/AC.10/C.3/22/Add.2

3. The Working Group reviewed the tables annexed to Part II of ST/SG/AC.10/C.3/22/Add.2. It was agreed that the references to packing group in the column "Remarks" of the various tables should be deleted as they were relevant for transport only.

CLASSIFICATION CRITERIA FOR FLAMMABLE LIQUIDS

Documents: ST/SG/AC.10/C.3/R.659 and -/C.3/R.721 (section 1) (Argentina)

4. Table 1, concerning test methods and definition of flammable liquids, was confirmed.

5. Documents ST/SG/AC.10/C.3/R.659 and section 1 of document -/C.3/R.721 were withdrawn by the expert from Argentina.

6. It was confirmed that additional criteria used for the carriage of flammable liquids in bulk in oil or chemical tankers (such as auto-ignition temperature) would not be taken into account for the development of an harmonized system.

60 °C flash point cut-off limit

Documents: ST/SG/AC.10/C.3/22/Add.2, annex, table 2
ST/SG/AC.10/C.3/R.745 (CONCAWE)

7. The representative of CONCAWE explained that the adoption of a 60 °C cut-off limit would cause problems to the European oil industry because gas oils, light heating oils and diesel fuels are manufactured to performance specifications which require that flash points exceed 55 °C. Typically they ranged from 55 to 75 °C, and they are produced in very high volumes. A 60 °C flash point cut-off limit would imply the application of different transport and storage regulations to products manufactured to the same specifications. In addition the flash point of such products would have to be tested and checked regularly from batch to batch.

8. Most european delegations and Canada supported the view of CONCAWE that these products (gas oils, light heating oils and diesel fuels) should all be treated in the same manner.

9. It was agreed to retain the flash point cut-off limit of 60 °C. It was also agreed that regulatory bodies could consider special clauses to allocate this group of products to one danger level only.

Upper flash point cut-off limit

Document: ST/SG/AC.10/C.3/R.785 (Japan)

10. The Working Group noted the information provided by the expert from Japan that fires involving substances with a flash point between 70 °C and 200 °C and even above 200 °C had happened and had caused deaths, injuries and considerable property damage. However the proposal to fix no upper flash point cut-off limit was not supported.

11. The Working Group had then to decide on the most appropriate flash point value (90 °C, 93 °C or 100 °C) for the upper cut-off limit.

12. Most delegations considered that there was not a very significant difference of level of safety between the three values, and the choice would depend in fact on the economic impact for the industry.

13. The 100 °C value was used in the past in Europe for inland transport regulations and is still used in certain european countries for storage regulations. However, lowering this value to 93 °C or 90 °C would imply no cost for the european industry.

14. The 93 °C (200 °F) value is used in North America and adopting the 100 °C value would result in important costs for the industry as many substances are manufactured to a specification meeting the just above 93 °C (but less than 100 °C) flash point value.

15. Several delegations supported the 90 °C value, as a round figure would be "politically" more acceptable and that value would not imply any cost either to the European or North American industry. However, as there was no objection to the 93 °C value, this latter value was adopted for the upper flash point cut-off limit.

CLASSIFICATION CRITERIA FOR FLAMMABLE GASES

Document : ST/SG/AC.10/C.3/22/Add.2, annex, Table 4

16. The Working Group agreed that the two levels of danger should be described as "high danger" and "medium danger" and that a low danger level would not be applicable. The high danger level covers gases which are considered as flammable according to the transport regulations, and the medium danger level covers any other flammable gases.

17. It was agreed that the wording of the text in the column "characteristics" for the medium danger should be consistent with that agreed for the high danger (i.e. reference to precise condition of temperature (20 °C and pressure (101.3 kPa)). After considerable discussion, the following text was agreed for the medium danger: "Gases or gas mixtures, other than those of high danger, which, at 20 °C and a standard pressure of 101.3 kPa, have a flammable range in mixture in air", even though the ISO standard 10156 does not make a specific reference to 101.3 kPa.

18. The Working Group noted that ISO published a second edition of ISO Standard 10 156 and that the reference to that standard should be "ISO 10156:1996".

Document: ST/SG/AC.10/C.3/R.730 (Canada)

19. The Working Group reconfirmed (see also ST/SG/AC.10/C.3/22/Add.2, Part II, para. 9) that methyl bromide and ammonia should be considered separately by regulatory systems and that there was no need to refer to these special cases as exemptions in the recommended harmonized classification system.

CLASSIFICATION CRITERIA FOR FLAMMABLE AEROSOLS

Documents: ST/SG/AC.10/C.3/22/Add.2, Part 2, paras. 10 to 18
ST/SG/AC.10/C.3/R.590 (United States of America)
ST/SG/AC.10/C.3/R.721, section 2 (Argentina)
ST/SG/AC.10/C.3/R.764 (United Kingdom)

Informal document: INF.36 (Germany)

20. In presenting ST/SG/AC.10/C.3/R.764, the expert from the United Kingdom first warned the Working Group that there was potential confusion over the term "aerosol", as it was often used to refer to aerosol dispensers even though the term strictly meant a physical state of a suspension of solid or liquid particles in a gas. He emphasized that this part of the Group's work was directed at the flammability of aerosol dispensers. He then distinguished the different flammability hazards which arose

(a) during transport/storage; and
(b) from consumer use;

and considered that these factors are very relevant to the development of harmonised flammability criteria for aerosol dispensers.

21. It was noted that the various definitions of "aerosols" in the UN Recommendations on the Transport of Dangerous Goods, the European Community Directive 75/324/EEC and the ICAO Technical Instructions were broad, as is explained in the annex to ST/SG/AC.10/C.3/R.764. These three definitions could be provisionally left in square brackets pending careful comparison and decision at the Committee session.

22. There were more divergent views as regards the definition of the term "flammable" in the case of aerosols. The EC directive 75/324/EEC as amended by 94/1/EC cover all aerosol dispensers containing any amount of flammable substance unless it can be proved by testing that the aerosol itself is not flammable . The expert from Germany considered that this was the widest definition and should be considered as the basis with possible cut-off levels to be developed. It was noted that within the EU a testing method for proving the non-flammability had not yet been adopted.

23. The definition in the UN Recommendations on the Transport of Dangerous Goods is restricted to aerosol dispensers containing more than 45% by mass, or more than 250 g, of flammable components. The relevance to such quantities was also questioned by some experts due to technicological changes. The expert from Germany questioned whether that definition, referring to quantities, was compatible with the principle of defining hazards according to the intrinsic properties of the substance.

24. Finally, the ICAO Technical Instructions, as an alternative to the UN Recommendations, includes a definition based on a flammability test. Several delegations considered that this performance test as well as the method being developed by the EU should also be taken into account.

25. As regards the possible definition of flammable substances contained in aerosol dispensers, it was left that the definitions and cut-off limits agreed for flammable liquids and gases should be considered.

26. The Working Group agreed to refer the question of definition of aerosols to the Committee. Further work will be needed to develop a suitable performance test and to complement the proposal on harmonised classification criteria for the flammability of aerosols.

Report to the Committee of Experts on the Transport of Dangerous Goods

Informal document: INF.48 (Germany)

27. The Sub-Committee agreed that the outcome of the work of the Working Group on harmonized classification criteria for flammability could be presented to the Committee as proposed by the chairman of the Working Group.

28. The expert from Germany recalled that definitions concerning compressed gases should also be included in the final document to be transmitted to IFCS. The chairman of the Sub-Committee said that this should be done as agreed at the 11th session of the Sub-Committee (see ST/SG/AC.10/C.3/22, para. 199).

Table 1: Testing methods and definitions

Testing methods	
testing methods for flashpoint determination	closed cup methods preferred, open cup methods only acceptable in special cases
(Draft) Definition of flammable liquids	
liquids to gases	vapour pressure at 50 °C > 300 kPa or completely gaseous at 20 °C (at standard pressure of 101.3 kPa)
liquids to solids	melting point ≤ 20 °C at 101.3 kPa or for viscous substances without a defined melting point, tested according to ASTM D 4359-90 or penetrometer as prescribed in Annex A.3 ADR with penetrometer according to ISO 2137:1985

Table 2: (Draft) Hazard levels of the classification of flammable liquids

Level	Uniform hazard description	Characteristics
Very high danger	to be developed	initial boiling point ≤ 35 °C flashpoint < 23 °C
high danger	to be developed	flashpoint < 23 °C, initial boiling point > 35 °C
medium danger	to be developed	flashpoint 23 °C - 60 °C
low danger	to be developed	flashpoint > 60 °C and ≤ 93 °C

Table 3: (Draft) Hazard levels for flammable solids

Level	Uniform hazard description	Criteria
high danger	-	not applicable
medium danger	to be developed	method as described in section 33 of the UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria screening test: testing time 2 min (20 min for metal powders) burning rate test: time < 45 s or rate > 2 mm/s or ≤ 5 min for metal powders wetted zone does not stop fire
low danger	to be developed	method and test as described before wetted zone stops the fire for at least 4 min burning rate test time more than 5 min and less than 10 min for metal powder

Table 4:(Draft) Hazard levels of the classification of flammable gases

Level	Uniform hazard description	Characteristics
high danger		gases which at 20 °C and a standard pressure of 101.3 kPa (a) are ignitable when in a mixture of 13 % or less by volume in air; or (b) have a flammable range with air of at least 12 percentage points regardless of the lower flammable limit. Flammability should be determined by tests or by calculation in accordance with methods adopted by ISO (see ISO 10156:1996). Where insufficient data are available to use these methods, tests by a comparable method recognized by a national competent authority may be used.
medium danger		gases or gas mixtures, other than those of high danger, which, at 20 °C and a standard pressure of 101.3 kPa have a flammable range in mixture in air.
low danger		not applicable